

XIV. *Notes on the Life History of Papilio demolion, Cram.*
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PLATE LXVI.

I HAVE, I suppose, at different times, bred some twenty to thirty species of tropical *Papilios*, mostly from ova, in various parts of the globe, but never have I seen anything the least like the peculiar method of ovipositing adopted by *Papilio demolion*, Cram.

We were collecting at Soekaboemi, in Java, on Feb. 6 in this year (1914), when I observed a ♀ of this species hovering over a broad-leaved jungle shrub (quite unknown to me), with the evident intention of ovipositing, and though *P. demolion* was common at Soekaboemi, and I had captured several specimens, not one was ever perfect, so I was glad to see a possible opportunity of breeding it. She took some time to make up her mind, as *Papilios*, and indeed all ♀ butterflies do, when an anxious entomologist is standing motionless by, watching her movements, on the tiptoe of expectation; but she settled at last, right in the centre of one of the large leaves, and then, strange to say, remained also apparently quite motionless, with wings outspread lying flat upon the leaf, more as though resting than with the desire to lay an egg, though the position of her abdomen suggested that such was her intention. This in itself struck me at once as most peculiar, as all the other *Papilios* I have ever seen ovipositing (including *P. erithonius* and *P. polytes*, which one would suppose to be closely allied species to *demolion*) fly from leaf to leaf, laying each ovum separately, fluttering all the time in the same way that the members of this genus have the habit of doing when sucking honey from a flower.

She remained in this position for at least two whole minutes, apparently motionless, and I remained the same, watching, till at last she got up and flew away, when to my astonishment I found, not one egg, but ten, rising in a vertical column from the centre of the leaf, placed one above the other, as shown in the Plate (see Plate LXVI, fig. 1).

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I now recalled having more than once observed these little pinnacles of ova on lime and lemon leaves when I had been searching for the larvae of other *Papilios*, but attributing them to the eccentricities of some moth, had thought no more about it. These, however, I, of course, took carefully back to the hotel, and on Feb. 14, eight days later (the usual period with *Papilios* being five or six days) nine out of the ten ova became healthy little larvae.

They hatched on the morning of the day I was leaving Soekaboemi, and the next day I was on board ss. *Houtman*, the Dutch steamer, *en route* for Brisbane; but of course I was feeding them on lime leaves, which I felt sure would always be procurable at all the different ports we were to touch at on the way.

The young larvae were very distinct from other *Papilios*, being of a deep bright ochre-yellow all over, very shiny in appearance, and most sociable in their habits, for always when not feeding they would sit closely packed together on one leaf, and if one or two for a short time got isolated from this family gathering they soon rejoined the group.

These larvae had been slow to hatch, but they had evidently no intention of being slow to grow now that they had hatched, for once outside their egg-shells they grew rapidly, the first moult being successfully achieved when only three days old, and they moulted again three days later, so that when only a week old they were already in the third skin. Unfortunately two died, but the remaining seven were getting on just as well as though they were on dry land, in fact I think the heat of my cabin was partly accountable for their rapid progress. They retained their bright ochre colour, with no white markings of any kind, throughout the first four stages, and they also retained their preference for each other's society, especially just before a moult was due to take place, when two or three would lie side by side awaiting the event.

Just before the end of the fourth stage a greenish tinge was visible beneath the shiny surface of ochre-yellow. This larvae at the beginning of the fifth moult was one of the prettiest I have ever seen, the usual green being replaced by a soft cobalt blue, only very slightly tinged with green, which, however, deepened as they grew older, though the blue tone was always the most prevalent, until the larva was hanging up for pupation, and then it entirely gave place to pale green.

I much regret not to have been able to draw this larva in its early stages, but on board ship this was impossible, especially as when the boat was motionless at the various ports, we were always much too busy on shore, searching for orange and lemon trees, or indeed any kind of *Citrus*, on which to feed, not only the *P. demolion*, but some fifty or sixty large larvae of *Papilio memnon*,* besides eight young larvae of some other *Papilio*, brought in on branches of lime, at Macassar (Celebes). The first *demolion* to pupate was on the very day we arrived at Brisbane, having therefore spent the whole of its larval existence at sea; and the others soon followed its example, but luckily not before I had had time to make a drawing of one of them. (See Plate LXVI, fig. 2.)

The pupa of this remarkable butterfly is also very distinct (see Plate LXVI, fig. 3), especially by the long projection below the thorax. As usual, those that pupated on the food-plant were green, and those which selected the side of the cage were brown.

* I was told by my friend Mrs. Walsh of Soekaboemi that *P. memnon* in Java has no less than six different forms in the ♀, and that was, of course, why we were breeding so many of them. Mrs. Walsh also told me that she was not acquainted with the ova of *P. demolion*, but had often found the larvae on lime trees, always, however singly, which can no doubt be accounted for by the other members of that group having fallen a prey to their innumerable enemies.—M. E. F.

EXPLANATION OF PLATE LXVI.

- FIG. 1. Egg-pile of *Papilio demolion*, Cram.
 „ 2. Larva „ „ „
 „ 3. Pupa „ „ „
 „ 4. Imago „ „ „

All the figures are of natural size.